



Distributed Energy Resources Collaboration Opportunities

ASERTTI Winter Meeting
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California Energy Commission

DER Objectives



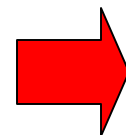
- DER that is clean, efficient, and cost effective
- Safe, reliable, & effective integration of DER into the distribution system
- Optimize DER to provide maximum system- wide benefits (reliability, power quality, security, etc.)

Other State Activities - A lot is happening...

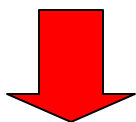


California Public
Utilities
Commission

California Energy
Commission

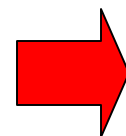


- Interconnection Rules
- Permit Streamlining
- R&D Efforts



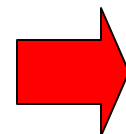
- Operational Impacts
- Ownership/control
- Valuation/Net Metering
- Consumer Education
- Rate Design
- Distribution Wheeling
- Stranded Costs
- Sale of Excess Capacity

California
Air Resources
Board



- Emission Standards

California
Power Authority



- DER Project Financing



But, much remains to be done - Major DER Issues Continue...



■ Generation

- DER technologies need to demonstrate sufficient overall efficiency, reliability, emissions, etc., to have widespread acceptance
- DER should be optimized for primary benefits (CHP, power quality, security, etc.) and be siteable
- Renewable DER technologies need to become more affordable



Major Continuing DER Issues



■ Market Integration

- Must implement national interconnection standards
- Determine how DER can access robust markets and be exposed to price signals
- Additional DER benefits need to be captured and monetized (e.g. T&D reliability, environmental, CHP, etc.)
- Need outreach to educate stakeholders and consumers



Major Continuing DER Issues



■ System Effects

- DER must have acceptable net air quality effects, given other benefits
- Need data clarifying DER benefits
- Must determine if high penetration of DER will have adverse impacts or benefits on T&D system
- Need to determine if microgrids can be used to optimize effects on T&D system



National Collaborative Opportunities



- Develop standardized nationwide protocols for testing and performance reporting of DER, including an unbiased database of project operation
- Determine overall net effects from widespread implementation of DER
- DER Education



Standardized Testing Protocols Project Update



- Problem: Consumers not using (and utilities not connecting) DER due to performance uncertainty
- Need
 - No common, standardized, national testing protocols for verification of operating characteristics for DER
 - Results of tests by different labs differ and differ from vendor's testing



Standardized Testing Protocols Project Update



- Project Objective: Develop testing protocols that:
 - Ensure consistent testing methodology and test results between testing facilities
 - Verify manufacturer's claims
- EPAG funding MTG protocol development at UC Irvine
 - Stakeholders commented and protocol revised
 - Final protocols anticipated June 2002
 - Expand to other DG technologies, CHP, etc.



Standardized Testing Protocols Project Update



- ASERTTI proposal to DOE OPT in Feb 2001
 - National testing protocol and standards
 - DOE finalizing approval
 - Reevaluate tasks, schedule and budget
 - Convene stakeholders and add new ones
 - Develop protocols, databases and conduct testing

Contact: Mike Batham, (916) 654-4548, mbatham@energy.state.ca.us

Grid Effects Testing



- Problem: Would high penetration have positive and/or negative effects on T&D system?
- Project Objective
 - Full-scale integration testing
 - Detailed exercising of variously configured systems
 - Interactions and benefits both evaluated



Grid Effects Testing



■ Scope

- Various off-the-shelf generation and storage technologies
- Various distribution system configurations (radial, network, etc.)
- Initially 2 year test program
- \$5M - \$6M million budget

■ Status

- DOE DPP planning **D**istributed **U**tility **I**ntegration **T**est
- DOE funding for testing phase uncertain
- PIER looking at cofunding ~\$2M
- Additional \$ for complete test program needed

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National DER Education



- Objective: Develop technical transfer process that enables DER success
- Sample Programs:
 - West Coast CHP Applications Center
 - Interconnection Best Practices/Guidelines Education



West Cost CHP Applications Center



- Objective: Develop technology transfer information for consumers
- Implementation Steps
 - Determine # and types of stakeholders
 - Types of technologies to be covered
 - Types of applications to be covered
 - Level of training provided



West Coast CHP Applications Center



■ Budget

- Startup: ~ \$400k - \$600k
- Yearly: ~ \$250k - \$500k

■ Schedule

- Spring '02: Secure participation and identify roles
- Summer '02: Prepare and submit proposal to DOE
- Summer '03: Implement program

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Interconnection Guidelines/Practices



- Objective: Develop a layperson's guide to interconnection
- Scope
 - Educate stakeholders on requirements, implications for DER and best practices
 - Provide clarification on application requirements and process
 - Provide information on contracts
 - Conduct training workshops for utilities, developers and manufacturers



Interconnection Guidelines/Practices



■ Budget

- Guide development: ~\$250k
- Training: ~\$10k/workshop

■ Schedule

- Summer '02: Secure commitments for participation
- Fall '02: Prepare and submit proposal to DOE
- Summer '03: Develop guide and training
- Fall '03: Conduct training classes

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Web Resources for California Energy Commission Distributed Energy Resources Activities

PIER: <http://www.energy.ca.gov/research/index.html>

CEC: <http://www.energy.ca.gov/distgen/index.html>